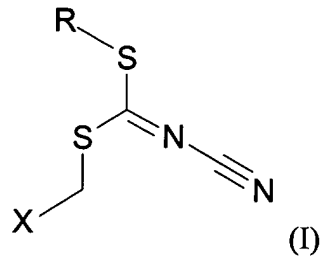
THE CLAIMED INVENTION IS:

1. A method for controlling the growth of at least one fungus on a tanned hide comprising the step of contacting a hide prior to, during and after tanning with a cyanodithiocarbimate of formula (I):



(I)

X is a halogen;

R is a substituted or unsubstituted C_1-C_{14} alkyl group, a substituted or unsubstituted C_2-C_{14} alkenyl group, a substituted or unsubstituted C_2-C_{14} alkynyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is a substituted or unsubstituted aryl group selected from phenyl, and naphthyl;

Y is H, halogen, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m ranges from 0 to 3;

n ranges from 0 to 3;

p ranges from 0 to 3; and

R^1 and R^2 are independently H, substituted or unsubstituted C_1-C_5 alkyl;

in an amount effective to control the growth of at least one fungus on the tanned hide.

2. A method of claim 1, wherein:

X is Cl, Br, or I;

R is a substituted or unsubstituted C_1-C_7 alkyl group, a substituted or unsubstituted C_2-C_7 alkenyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is phenyl;

Y is H, Cl, Br, I, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m is 0 or 1; and

R^1 and R^2 are independently H, methyl, or ethyl.

3. A method of claim 1, wherein

X is Cl and R is $-CH_3$, $-(CH_2)_2CH_3$, $-(CH_2)_3CH_3$, $-(CH_2)_5CH_3$, $-(CH_2)_7CH_3$, $-(CH_2)_{11}CH_3$, $-CH(CH_3)_2$, $-CH(CH_3)(CH_2)_3CH_3$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2CH_2O)_2CH_2CH_2OH$, $-(CH_2)_2CO_2H$, $-CH_2CH_2CN$, $-CH_2CH{=}CH_2$, or $CH_2C_6H_5$;

X is Br and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$; or

X is I and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$.

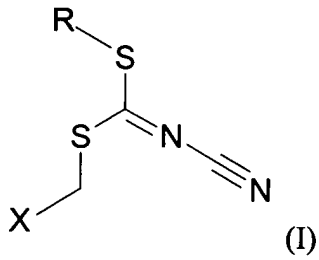
4. A method of claim 1, wherein the cyanodithiocarbimate of formula (I) is hexyl chloromethyl cyanodithiocarbimate.

5. A method of claim 1, wherein the leather substrate is a wet blue hide a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

6. A method of claim 3, wherein the leather substrate is a wet blue hide a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

7. A method of claim 4, wherein the leather substrate is a wet blue hide a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

8. A method for controlling the growth of microorganisms on a hide during a leather tanning process comprising the step of contacting a hide susceptible to fungal growth with a tanning liquor containing a cyanodithiocarbimate of formula (I):



(I)

X is a halogen

R is a substituted or unsubstituted C_1-C_{14} alkyl group, a substituted or unsubstituted C_2-C_{14} alkenyl group, a substituted or unsubstituted C_2-C_{14} alkynyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is a substituted or unsubstituted aryl group selected from phenyl, and naphthyl;

Y is H, halogen, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m ranges from 0 to 3;

n ranges from 0 to 3;

p ranges from 0 to 3; and

R^1 and R^2 are independently H, substituted or unsubstituted C_1-C_5 alkyl;

in an amount effective to control the growth of at least one fungus on the hide.

9. A method of claim 8, wherein

R is a substituted or unsubstituted C_1-C_7 alkyl group, a substituted or unsubstituted C_2-C_7 alkenyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is phenyl;

Y is H, Cl, Br, I, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m is 0 or 1; and

R^1 and R^2 are independently H, methyl, or ethyl.

10. A method of claim 8, wherein

X is Cl and R is $-CH_3$, $-(CH_2)_2CH_3$, $-(CH_2)_3CH_3$, $-(CH_2)_5CH_3$, $-(CH_2)_7CH_3$, $-(CH_2)_{11}CH_3$, $-CH(CH_3)_2$, $-CH(CH_3)(CH_2)_3CH_3$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2CH_2O)_2CH_2CH_2OH$, $-(CH_2)_2CO_2H$, $-CH_2CH_2CN$, $-CH_2CH{=}CH_2$, or $-CH_2C_6H_5$;

X is Br and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$; or

X is I and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$.

11. A method of claim 8, wherein the cyanodithiocarbimate of formula (I) is hexyl chloromethyl cyanodithiocarbimate.

12. A method of claim 8, wherein the hide is a wet blue hide, a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

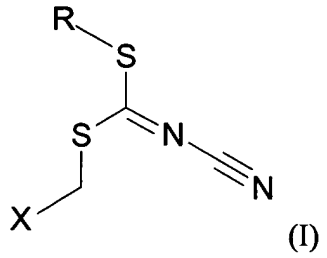
13. A method of claim 10, wherein the hide is a wet blue hide, a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

14. A method of claim 11, wherein the hide is a wet blue hide, a wet white hide, a vegetable-tanned hide or an oil-tanned hide.

15. A method of claim 8, wherein the tanning liquor is a pickling liquor.

16. A method of claim 8, wherein the cyanodithiocarbimate of formula (I) is present in the tanning liquor in an amount ranging from about 5 to about 500 parts per million.

17. A liquor for use in a leather-tanning process comprising a cyanodithiocarbimate of formula (I):



(I)

X is a halogen;

R is a substituted or unsubstituted C_1-C_{14} alkyl group, a substituted or unsubstituted C_2-C_{14} alkenyl group, a substituted or unsubstituted C_2-C_{14} alkynyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is a substituted or unsubstituted aryl group selected from phenyl, and naphthyl;

Y is H, halogen, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$;

m ranges from 0 to 3;

n ranges from 0 to 3;

p ranges from 0 to 3; and

R^1 and R^2 are independently H, substituted or unsubstituted C_1-C_5 alkyl.

18. A liquor of claim 17, wherein

R is a substituted or unsubstituted C_1-C_7 alkyl group, a substituted or unsubstituted C_2-C_7 alkenyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is phenyl;

Y is H, Cl, Br, I, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m is 0 or 1; and

R^1 and R^2 are independently H, methyl, or ethyl.

19. A liquor of claim 17, wherein

X is Cl and R is $-CH_3$, $-(CH_2)_2CH_3$, $-(CH_2)_3CH_3$, $-(CH_2)_5CH_3$, $-(CH_2)_7CH_3$, $(CH_2)_{11}CH_3$, $-CH(CH_3)_2$, $-CH(CH_3)(CH_2)_3CH_3$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2CH_2O)_2CH_2CH_2OH$, $-(CH_2)_2CO_2H$, $-CH_2CH_2CN$, $-CH_2CH=CH_2$, or $-CH_2C_6H_5$;

X is Br and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$; or

X is I and R is $-(CH_2)_3CH_3$, or $CH_2C_6H_5$.

20. A liquor of claim 17, wherein the cyanodithiocarbimate of formula (I) is hexyl chloromethyl cyanodithiocarbimate.

21. A liquor according to claim 17, wherein the liquor is selected from a pickling liquor, a chrome-tanning liquor, a white-tanning liquor, a vegetable-tanning liquor, an oil-tanning liquor, a post-tan washing liquor, a retanning liquor, a dye liquor, and a fatliquor; and wherein the microorganism is algae, fungi, or bacteria; and the cyanodithiocarbimate of formula (I) is present in the tanning liquor in an amount ranging from about 5 to about 500 parts per million.

22. A liquor according to claim 19, wherein the liquor is selected from a pickling liquor, a chrome-tanning liquor, a white-tanning liquor, a vegetable-tanning liquor, an oil-tanning liquor, a post-tan washing liquor, a retanning liquor, a dye liquor, and a fatliquor; and wherein the microorganism is algae, fungi, or bacteria; and the cyanodithiocarbimate of formula (I) is present in the tanning liquor in an amount ranging from about 5 to about 500 parts per million.

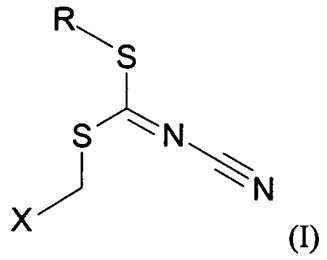
23. A liquor according to claim 20, wherein the liquor is selected from a pickling liquor, a chrome-tanning liquor, a white-tanning liquor, a vegetable-tanning liquor, an oil-tanning liquor, a post-tan washing liquor, a retanning liquor, a dye liquor, and a fatliquor; and wherein the microorganism is algae, fungi, or bacteria; and the cyanodithiocarbimate of formula (I) is present in the tanning liquor in an amount ranging from about 5 to about 500 parts per million.

24. A liquor of claim 21, wherein the liquor is a pickling liquor.

25. A liquor of claim 23, wherein the liquor is a pickling liquor.

26. A liquor of claim 17, further comprising a solvent selected from methyl ethers of glycols, M-pyrol, and petroleum distillates; and a diluent selected from soybean oil, pine tree oil, cottonseed oil, corn oil, canola oil, peanut oil, palm oil, rice oil, olive oil, tung nut oil, castor bean oil, linseed oil, citrus oil, and datenut oil.

27. A cyanodithiocarbimate of formula (I):



(I)

X is a halogen;

R is a substituted or unsubstituted C_4-C_{14} alkyl group, a substituted or unsubstituted C_2-C_{14} alkenyl group with the proviso that it is not $-CH_2CHCH_2$, a substituted or unsubstituted C_2-C_{14} alkynyl group, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is a substituted or unsubstituted aryl group selected from phenyl, and naphthyl;

Y is H, halogen, NO_2, R^1, R^1O, R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, $R^1OCH_2CH_2(OCH_2CH_2)_p$

m is 0, 2, or 3;

n ranges from 0 to 3;

p ranges from 0 to 3; and

R^1 and R^2 are independently H, substituted or unsubstituted C_1-C_5 alkyl.

28. A cyanodithiocarbimate of claim 27, wherein

R is a substituted or unsubstituted C_5-C_7 alkyl group, a substituted or unsubstituted C_2-C_7 alkenyl group with the proviso that it is not $-CH_2CH=CH_2$, a substituted or unsubstituted group defined by Y-Ar-$(CH_2)_m$- or by Z-$(CH_2)_n$-;

Ar is phenyl;

Y is H, Cl, Br, I, NO_2, R^1, R^1O, or R^1R^2N;

Z is NC, R^1O, $R^1OC(O)$, or $R^1OCH_2CH_2(OCH_2CH_2)_p$

m is 0; and

R^1 and R^2 are independently H, methyl, or ethyl.

29. A cyanodithiocarbimate of claim 27, wherein

X is Cl and R is $-(CH_2)_5CH_3$, $-(CH_2)_7CH_3$, $-(CH_2)_{11}CH_3$, $-(CH_2)CH(CH_3)_2$, $-CH(CH_3)(CH_2)_3CH_3$, $-(CH_2)_2OH$, $-(CH_2)_3OH$, $-(CH_2CH_2O)_2CH_2CH_2OH$, $-(CH_2)_2CO_2H$, $-CH_2CH_2CN$, $-CH_2C_6H_5$;

X is Br and R is $-(CH_2)_3CH_3$, or $-CH_2C_6H_5$; or

X is I and R is $-(CH_2)_3CH_3$, or $CH_2C_6H_5$.

30. Hexyl chloromethyl cyanodithiocarbimate.